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doubtedly due in large part to slight changes in the position of the platinum wire that furnished the oscillating contact on the fork. We have contented ourselves, then, with giving three typical series of results that indicate at once the constancy and variability of the results. It will be noticed that there seems to be a slight relative gain of energy for the larger currents in the telephone, which makes the series increase more rapidly than the ammeter readings.

We have not attempted to fit a curve or an equation to the results, but leave them in the raw state. It will be seen that it is only very roughly that the intensity of the sound may be regarded as a function of current. Any even fairly delicate work would require correction. We have not considered here the loss of energy in the air between telephone plate and ear, which might conceivably still further modify the results.

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DISCUSSION

METAPHYSICS, SCIENCE OR ART

IN a recent number of this JOURNAL[1] Dr. Ewer contributes, under the above title, comments upon the art-character of metaphysics, in which he devotes some notice to an article of mine on 'Metaphysics as a Branch of Art.' I appreciate the courtesy of the criticism, but regret that I can not agree with his corrections.

1. Dr. Ewer holds that "The purpose of metaphysics is the purpose of science, not the purpose of art. The metaphysician aims at the discovery of truth; the artist at the production of beauty. The one constructs an idea which, he hopes and believes, correctly represents reality; the other makes a reality which expresses an idea. . . . His purpose [the metaphysician's] is to make a mental copy of reality in its important features and principles, and the thing has metaphysical worth only as it is a correct copy."[2] And the further distinction is made that metaphysics aims to tell the truth, whether pleasant or not, whereas art frankly seeks to please. Now, I believe that Dr. Ewer is quite right in adopting, as he does here, the pragmatic criterion of 'purpose.' The purpose or end of metaphysics and of art should be the test of what they are; only I do not agree to the particular purposes which are assigned. To say

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[1] Vol. III., No. 20.

[2] Pp. 546–7.

that the aim of metaphysical thought is to copy reality is to make that thought mechanical and purely representational. I leave others to take vengeance of this sin,[3] and I wish to point out that if the artist is to make a reality which expresses an idea, he, too, is but a mechanical device for reproducing a model, namely, the idea, which is already set for him. This scarcely seems to do justice to the creative element in art. Nor should I agree that the artist always seeks to please, while the metaphysician aims to tell the truth, whether pleasant or not. The artist rather seeks to interest, to impress and to stimulate, and that, too, whether we like it or not. Does Tolstoi or does Hardy ever hesitate to let us have an unpleasant truth if he thinks we ought to get it?

2. Dr. Ewer does not find that my analysis of categories into motor attitudes, and hence emotions, is supported by his introspection, and he could not, therefore, of course, agree with conclusions based upon it. He finds that 'speculation, upon the nature of time or space for instance, may proceed without other emotional consciousness than satisfaction in the search for truth.'[4] All I can say is that when I make the attempt myself to appreciate or at all realize the meaning of space and time or any abstract category, and when I witness the contortions of others who are trying to be intelligible upon these subjects, I can not but envy the Brahmic calm of one who feels only the 'satisfaction in the search for truth.'

3. One of Dr. Ewer's citations from my article seems to me somewhat indiscriminately severed from its context. He says: "And finally, the charge that Augustine's solution of skepticism and Kant's ethical prescription have no result upon overt action seems to me in the plainest contradiction to facts."[5] Whereas my text reads:[6] ". . . Or take Kant's prescription of 'simple conformity to law in general.' What result would that have upon overt action? Some result at some time, of course, but nothing that we can immediately indicate." The criterion in this passage, as in the discussion which precedes it, is immediacy and not overtness, as Dr. Ewer has assumed it to be.

4. Finally, it would have been more satisfactory if Dr. Ewer had stated somewhat explicitly what the resemblance is between metaphysics and science. He admits and emphasizes the art-qualities in metaphysics, and he says that metaphysics is not science in the ordi-

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[3] Especially in Moore's monograph, 'The Functional *vs.* the Representational Theories of Knowledge in Locke's Essay,' this point of view seems to be adequately met, not to say swallowed.

[4] P. 547.

[5] P. 548.

[6] This JOURNAL, Vol. III., No. 14, p. 370.

nary usage of the term. But in what usage of the term it is science he does not reveal.

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REVIEWS AND ABSTRACTS OF LITERATURE

La théorie physique; son objet et sa structure. P. DUHEM. Paris: Chevalier & Rivière. 1906. Pp. 450.

This volume is the book-form of the series of articles which first appeared in the *Revue de philosophie* for 1905.

The author is recognized as one of the foremost authorities and scholars in his line; from him there have come a number of highly valued and exhaustive treatises on chemical mechanics, on hydrodynamics and on electricity and magnetism, as well as other and more simple works written with a distinctly didactic purpose. One of the most important characteristics of all of this systematic work in these diverse fields is the acceptance and use, in each of them, of certain fundamental principles by which a unification or 'natural classification' is brought into the treatment of the various classes of physical phenomena. That principle which in particular enables him to do this is the generalized 'second law,' which was developed first in thermodynamics, and according to which, in its extended form, every energy-transfer 'goes out' from the higher potential to the lower, provided such a potential difference is uncompensated, etc. The author thus allies himself closely with Nernst, Gibbs, Mach and a number of other leading physicists. From time to time he has appeared as an opponent of Poincaré concerning various questions.

This present work of his, together with some other contributions, places him in that rapidly growing group of scientists who look at their science retrospectively, analytically, broadly, or, as one might say, philosophically. In reading it one feels that he has before him the exposition of a master, of one who not only knows and uses the technique, but who also sees the logically and historically significant thing, and who speaks, therefore, with well-justified confidence. However, in this review it is possible only to indicate a few important main points out of much that is of great value in the matter presented.

The volume consists of two parts, the first dealing with 'the object of physical theory,' the second with its 'structure.' The first part is divided into four chapters, and each of these into a number of sections.

In Chapter I., in which there is discussed the relation between 'physical theory and metaphysical explanation,' M. Duhem finds that neither historically nor logically is the former subordinate to the latter, but that it is autonomous. To state simply just what the author means by 'physical theory' is at this point impossible, since, indeed, the elucidation of this is the purpose, in great part, of his subsequent discussions. By 'metaphysical explanation' there are referred to, as it becomes clear later, views as to the ultimate nature of physical phenomena, assumptions